The Indianapolis Animal Testing and Educational Center: A Theoretical Development within Downtown Indianapolis

OUT! of the Basement

An Honors Creative Project (HONR 499)

by

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April 2017

Expected Date of Graduation

May 2017

Abstract

Indianapolis, Indiana serves as a hotbed of animal testing research for biomedical purposes with no fewer than six separate state of the art facilities. A global movement towards transparency in the animal testing environment has identified several greater benefits. However, despite considerable research and action into public transparency in other areas, little information exists on resolving this interest using an architectural lens. This study examines the validity of this approach through an exploration of retrofit possibilities at Research II located in Indianapolis. The exploration serves as an example of how architects might resolve cultural issues though architectural means.

Acknowledgments

I would like to thank Doctor Tom Collins for assisting me throughout the entirety of this project as my advisor. His guidance extends beyond this project as a studio professor, mentor, and precedent throughout my undergraduate career.

I would also like to thank Jim Hill from the architectural firm BSA LifeStructures, Alex DeKemper at Ball State University, and the staff of Research II at IUPUI for being an invaluable asset towards the advancement of the project.

Finally, I would like to acknowledge Rachel for her inspiration and encouragement through the project's evolution and development.

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Process Analysis Summary

I am quite satisfied with the steps taken in order to progress the project to its current evolution. Of course, there are some instances in which I prefer to have done differently.

Firstly, while it is important to submit to the Office of Research Integrity diligently, I wish I would have been swifter in my response to them. The delay in edits meant that several opportunities for interviews were lost. Understanding how the IRB operates will better assist my future projects where I am dependent on the approval.

When trying to find precedents to a project, the internet can provide a vast wealth of information that has to be sifted through. However, speaking with professionals on a topic focus your research efforts in multiple ways. Their knowledge can quickly push you in the correct direction rather than spending countless hours gathering information which could or could not be helpful. This is most evident in my correspondence with BSA LifeStructures. In just a few short hours in the informal critique, I had a larger understanding on the complications surrounding transparency in the animal research environment compared to the countless nights spent online and in the library. Face to face correspondence is still important.

Most importantly, I feel like I learned the value in "precision of language." How you phrase an argument is just as important as the content. I had never thought that this project would turn from design theory into legitimate debate. People with similar ideologies were split in their thoughts because of how world choice was implemented. However, given enough time, even those confused eventually understand the premise of the complex topic that was my project.

I hope I receive the chance to expand upon this project, for I learned I am passionate in the social-cultural issues of this topic. Not once through this semester did I wish I chose a different thesis. If anything, I have found an avenue I can expand on later in my career.

Premise

Indianapolis, Indiana is a hotbed for pharmaceutical animal testing. Between Butler University, Eli Lilly and Company, Harlan Laboratories Inc., Harrison College, IUPUI, and the Methodist Research Institute, Indianapolis is one of the leading cities in the nation which perform humane and vital experiments to expand academic knowledge and further medical advancement. Certain cases of inhumane treatment, public misinformation, and the works of animal activist groups have negatively impacted the reputation of animal testing facilities.

The initial idea for this project was spurred on by a design studio assignment in the Fall of 2015 within the College of Architecture and Planning at Ball State University. The particular assignment involved designing a community outreach center in Gary, Indiana focused on rebranding the image and celebrating the history of the steel industry. Overseas competition caused U.S. Steel's Gary Works to reduce their workforce from over 30,000 employees to just over 5,000 in the course of a 20 year period. This industry shift lead to disinterest, economic stress, and increased crime in the area. The project sought to reconnect Gary with industry. Through architectural means, a specially designed program would attempt to heal the public disconnect from the strong history of the company which provided thousands of jobs. Similarly, a specific program and facility could bridge the lack of understanding the general public faces concerning biomedical animal research laboratories.

Two goals were established in order to drive the project further:

1.) To conduct research into understanding the changing public perspective on animal testing compared to factual procedures performed within an animal laboratory.

2.) To conduct research into what laws, regulations, and building codes are relevant to the construction and operation of an animal testing facility.

A secondary data collection came from interviews. I will explain in detail later in this report. through tours of animal research facilities as well as personal interviews as described later in the analysis.

While the findings of the project are mainly targeted towards the general populace, the purpose of the project is to provide designers vital information in creating a connection between scientific research and public education. Precedents with similar programs will be helpful as select designers have already tackled the issue. Finding problems that arise when merging these two program usages and proposing solutions will continue the dialogue when similar projects are proposed. Even if the specifics of the design are never translated into a real-world application, the research performed will serve as an example in cultivating the public's interest into fields which traditionally have kept their doors closed.

IRB Approval

It was deemed necessary to include the perspectives of the people who interacted with these facilities on a day-to-day basis. Occupants were broken down into five major categories: the general public, officials/VIPs, principal investigators, animal caretakers, and maintenance workers. Each of these categories would have differing opinions on the topic of transparency. Informal interviews were planned for each group. A set of interview questions were drafted with follow-up questions which included but were not limited to:

1.) What is your connection to the animal research environment?

2.) What were/are some of your goals in this position?

3.) How has public perception impacted the decisions you have made within your position?

After review by the BSU Office of Research Integrity, the project was approved in order to conduct the interviews. The risk to the subjects was deemed minimal since no personal or identifying information would be collected, and the protocol was given an "exempt" status.

Need for Transparency

There is a rising desire in American culture to be aware of the evolution of products -- the story of how they reach the consumer. The "farm to table" movement is but one example of how people are longing to know how their meats are raised or how their produce is grown. Transparency throughout the process ensures that beef is reared without antibiotics and that crops are grown without the use of pesticides or artificial fertilizers. Our culture finds value in this, level of transparency.

However, few members of society know the processes related to how common drugs are researched and produced. The evolution of each and every drug naturally progresses from initial research, to animal testing, to human clinical trials, and finally to approval of the FDA before being sold into circulation. Some individuals who do care about the animal process are misinformed. Animal Right's Activist groups such as PETA, (the People for the Ethical Treatment of Animals), have accelerated this misinformation by connecting the benefits of biomedical animal research with controversial cosmetic related animal research. The World Health Organization in 1997 declared that the benefits of animal based research far outweigh the risks associated with vaccine and other medical products produced through genetic engineering (World 1997). In addition, the Reviewing Animal Trials Systematically Group has performed extensive research into human benefits such as low level laser therapy as well as stress and coronary heart disease research (Pound 2004). It seems that education and greater transparency into how the animal testing process actually functions would decrease the amount of negative attention and reaction that principal investigators receive then they attempt to solve medical issues that benefit human health.

While a push towards transparency exists in animal research within the United States, the movement has more traction in European countries such as Spain, Germany, and Great Britain. In mid-September of 2016, the European Animal Research Association created the *Transparency Agreement on the Use of Animals in Scientific Research*.

Within the document, four principles were established in order to facilitate participatory involvement between scientists and citizens (Martinez-Sanchez 2017). They are as follows:

1.) *We will be clear about when, how, and why we use animals in research.*
2.) *We will enhance our communications with the media and public about our research using animals.*
3.) *We will be proactive in providing opportunities for the public to find out about research using animals.*
4.) *We will report on progress annually and share our experiences.*

The Spanish Transparency Agreement was signed by over 90 organizations who wished to begin a public dialogue between investigators and consumers. Besides this agreement, many earlier organizations such as Pro-Test Germany and Understanding Animal Research fought for these same goals with varying result (Martinez-Sanchez 2017). In the U.S., Logan France of the University of Baltimore has worked to create the Biomedical Research Awareness Day; which is a university event run by veterinarians in order to promote the use humane use of animals in scientific research (France 2017).

Yet, none of these organizations attempted to tackle the issue of transparency through an architectural lens. Therefore, this project creates a new approach to transparency using a new set of methods.

Outreach to BSA LifeStructures

In order to gain insight into animal testing facility design, the investigation sought out local design firms with expertise. One such firm is BSA LifeStructures.

Founded in 1975, BSA LifeStructures is an architectural firm that specializes in biomedical and higher education facilities. Their biography claims that "a balanced blend of inspired creativity, evidence-based design, and years of experience, [the firm] has created facilities for some of the nation's top healthcare, higher education, and

research institutions" and their project portfolio verifies these claims (BSA, 2017). Building Design + Construction claims that the firm ranked 25th in the nation for revenue generated through state of the art healthcare facilities (Giants 300, 2015). Their expertise is known and recognized throughout the world

Early in the project's development, BSA LifeStructures sent an email to the College of Architecture and Planning looking for opportunities that the firm could engage with student work. Through several email transactions, a relationship was established which would affect the project in a substantial way. Their assistance throughout the entirety of the project consisted of relevant research articles, a tour of a facility they designed, an informal critique, and informal interviews.

Tour of Research II

Research Center II is an underground biomedical and research facility located on the Indianapolis University-Purdue University campus. BSA LifeStructures played a pivotal role in the design and construction of the building, and therefore was able to secure a tour of the facility despite issues of controlled access. The facilities manager and caretaker staff were helpful and diligent with their responses to my questions. Through their explanations, my eyes were opened to the programmatic world of biomedical research. The organizational layout, user circulation flow, and technical systems were explained in detail as members of the staff whizzed about performing their daily activities. This tour illuminated the investigator into the organized day-to-day chaos that is IUPUI's Research II's day-to-day operation.

Several things are worth noting that were mentioned during the tour:

1.) Circulation was a primary concern for each user. Animals needed transport between housing and procedure rooms. Feed and bedding needed to be transported from the loading dock. Waste needed a means to cleanly exit the building. Therefore, the layout of each program space was meticulous in that

each room was arrayed for maximum efficiency and aesthetics was not a major concern.

2.) Access to the facility was controlled by means of a secured elevator passing by the administrative and manager offices. Every room down to the custodial closets were key-card secured and programmed to open for certain personal during specific times in the day. Any breach of these protocols would be logged in the central control computer. Security was paramount.

3.) Airlocks separated the Biosafety Level 3 and other quarantine rooms from the main circulation to prevent airborne pathogens and unwanted particles from contaminating the rest of the facility.

4.) Strict day/night cycles were maintained throughout the entire facility to ensure as few variables as possible concerning the experiments. These usually operated on a six hour daylight period followed by a 6 hour dark period, but could vary depending on what housing rooms were occupied in certain wings of the facility. Emergency lighting was only permitted along the hallways during the dark cycles. Yet, the animals need to be under constant supervision for their safety as well as the security of valuable research assets. A certain translucent red glass was used sparingly in the mouse and canine housing rooms because the biology of these species see this material as opaque.

5.) Sanitation and sterility were critical factors in the operation of these facilities. Local and national agencies schedule regular inspections to ensure that the facility runs without contamination which could compromise the results of the experiments. Small infractions such as chipping or scuffs in the wall could lead to serious fines, and therefore precautions are taken to avoid this. Bump rails are installed on all of the wall surfaces as the building's normal operation sees large carts moving quickly from location-to-location.

6.) Interviews with the workers in the facility mainly focused on their comfort levels with proposed changes. While hesitant to comment, and initially skeptical of altering their regimented schedules, they were open to the idea of change as long as the animals were kept secure and under constant

> supervision. After all, there was a consensus claim that the caretakers and veterinarians cared about the welfare and well-being of the animals as their primary focus. When asked why they perform most of their operations behind secure barriers, the general responses were that they fear persecution or negative comment by the general public, and that they were more comfortable "in the basement." The title of the study stems from this existing reality.

Each of these six observations were framed as opportunities and challenges in redesigning an animal research facility. However, it would be impossible to design a facility based upon one instance, even if the designer was allowed to delve into the relatively unknown aspects of its operation. Determining what the precedent among these buildings was critical to suggesting any changes to allow the retrofitted design to relate to most facilities.

Precedents

Considerable research was performed in order to determine whether Research II followed the standard conventions in most biomedical animal research facilities. One important organization was the Whole Building Design Guide which has devoted an entire subsection on their website into the minutia of operations as well as the list of program spaces along with their relative positions in the overall floor plan. They list several rising concerns on their page, but the two most relevant issues are the "initiatives to promote psychological well-being of animals… providing for such natural behaviors as exercise, opportunities for group interactions, and nesting and foraging" along with "a 'zoning' approach to facility layout that allows access to daylight via windows or other means at office and non-sensitive support spaces without having the staff leave the animal environment" (Stark 2010). It is here where we find our first documented instance of an organization identifying an architectural need within the animal testing realm. Value exists in providing natural and aesthetic comforts to the occupants of the building: both animal and human. More importantly, it would appear

that these values can easily be achieved through architectural means by restructuring the layout of the facility.

In order to determine layout of these program spaces, the Whole Building Design Guide provides a detailed list of every space from caretaker changing and break rooms to loading docks and bio-disposal chambers. Their standard model places program uses in two defined realms: the public realm and the animal environment. The public barrier separating these two are bridged in only a few areas. Employee changing facilities and entrance to procedure rooms serve as the main entry points in the provided examples, but are still secured with key-cards or other security devices.

An attempt was made in order to find a precedent which violated as many of these principles proving that changes are possible. The Biosciences Research Building in Galway, Ireland was found to infringe on most of the rules presented by the Whole Building Design Guide. The project was completed in 2013 and is located deep within the University of Ireland's campus. What differentiates this facility more than others is the mixture of program spaces and how circulation is organized.

Programmatically, the first floor consists of classrooms and shared spaces between the scientists working upstairs and the students attending the university; the second floor consists of biomedical laboratories with curtain wall glass along the north and south facades shining daylight into open concept work stations; the upper floor consists of the animal housing and procedure rooms (Committee 2017).

Vertical circulation is controlled through centrally located elevators which prevent unauthorized personal on certain floors. However, the common spaces are completely shared on the lower floors which forces scientists and students to interact socially. Value is found in this interaction since it humanizes the actions of the workers when they have an opportunity to engage the general public (Committee 2017). Visually, the building appears transparent in nature. The curtain walls stretch from ground level to the ceiling allowing passerbys to witness the movement of people and equipment along all

floors. While initial reactions might state the design is impractical, the knowledge that it is built proves that values over aesthetics and transparency trumped these practical mindsets during the design phases.

Redesign Ideas

With the observations at Research II, understanding of how research facilities are run, and knowing that precedents exist which bend the rules on what defines an animal research facility, I felt comfortable enough to suggest some alterations on a general level. Security needs were broken down roughly into three separate zones: the public, semi-public, and private realms. While certain program spaces had to stay secured behind the barrier, opportunities to place I the procedure rooms in the semi-public and employee support areas into the public realm were possible based on the precedent studies and literary review recommended. Challenge arise in that circulation is vitally important to the operation of the facility. Every shift must be consciously aware of the needs of the space and how easy it is for users to access adjacent, dependent programs.

A similar program space that suffered many of the same issues was that of a museum. Typically, the museum is thought of a publicly dominated space with citizens travelling to and from exhibits across many floors in order to experience the artifacts on display. It is interesting to see a cultural mindset that the museum is a public-controlled space, rather than one determined by program use because it shares many similarities to animal research facilities. Likewise, the museum's spaces can be categorized into public, semi-public, and private realms; the largest portion of the building is the public realm where occupants visually engage with artifacts, the semi-private realm where delicate or valuable artifacts are kept/observed by key personal, and the private realm where artifacts are stored or analyzed in a completely secure and controlled environment. The difference is that while museums harbor artifacts hundreds or even thousands of years old, the artifacts of animal research facilities are living creatures. Of course, this is but one of a list of challenges discussed in a previous chapter.

Nevertheless, the public finds value in observing the processes performed by scientists in order to find new information over relatively unknown topics; and, the people are willing to travel to an operational facility that is designed to showcase the benefits of this work with the workers who have a vested interest in engaging with the public. Therefore, this analogy would be critical when suggesting any changes since the model is proven to be successful.

Critique at BSA LifeStructures

A team of licensed architects at BSA LifeStructures lent their assistance to the investigator by offering to review the progress of the project at their headquarters in Indianapolis. Over the course of an hour, ideas related to transparency and public engagement were shared with six designers that had extensive knowledge in the field of animal facility design. Their comments, observations, and reservations are included in the following:

1.) While there are both practical and cultural barriers to architectural transparency, it was unanimously agreed that cultural issues would be the more difficult problem to address. The critics made comments that practical considerations change status quo practices such as putting expensive, vibration-sensitive equipment had made its way to upper levels despite having the practical solution being to place it in the basement. The primary reason was due to flooding concerns, but nevertheless, it serves as an example of changing program dynamics which once was deemed immovable. Convincing the occupants to open their doors to the public would deem challenging due to user's comfortability "within the basement."
2.) Opportunities for advertisement exist when placing the day-today-operations of a building on display. Research II is an example of a contract research organization (CRO) which means that caretakers are in charge of maintaining the sterility of the environment in addition to the welfare of the animals. Principal investigators contact a CRO in order to form a contract to use their

facility as well as to hire their caretakers for their neurological experiments or clinical drug trials. With a CRO, the PI does not have to worry about hiring a team of competent employees who would not be familiar with the operation of the facility. These CROs are dependent on the PI's funds, and so by allowing them access to the environment, they might be more comfortable in selecting their particular CRO.

3.) Additional measures would have to be taken in order to ensure the security of patented information. Large corporations such as Eli Lilly prevent outsiders from bringing their cellphone behind the public barrier for fear of competitors obtaining proprietary information. This might persuade PIs to select a separate facility due to the inherent risks involved with their particular research. So, it is important to maintain privacy with research data. Some things need to be behind closed doors.
4.) Geographic culture may play into what is and is not accepted in these types of environments. The comment was made that Indiana does not have a large animal activist movement compared to that of California or New York. Likewise, it was the experience of one of the reviewers that southern states such as Louisiana had little to no activism present leading to some facilities prominently being displayed on billboards. However, since this project is specifically focused on the Indianapolis area, no research was performed outside of the Metropolitan area in order to maximize results.
5.) Precision of language was important in explaining these concepts to new individuals. Without carefully thought explaining the benefits of transparency, the majority of listeners would become confused or uncomfortable on such a controversial topic.

Design Intervention

Attached you will find the presentation board that was developed utilizing all of the research showcased in this analysis report. To complement this, an example of how IUPUI's Research II could be altered to reflect these ideas are integrated in the board.

The diagrams and drawings are a visual representation of the project's core ideas presented in a way that is easy to grasp by both people who are educated in the animal research environment along with the general public. The purpose of the board is an educational tool used by the presenter in order to express the changes to Research II and continue a dialogue with those who might be opposed to the idea of transparency in the animal research environment.

Conclusions

This project took bold steps in creating a category with little to no existing research. However, there is much to be explored before these ideas will be accepted into a general society. The dialogue between user and public must first be strengthened.

If the project were to continue, an in-depth survey would be designed to target members of the Indianapolis community. Questions would include how knowledgeable are people over the animal testing environment. Most importantly, questions would be asked in how much value they perceive in engaging with these operations. Is knowledge over the processes enough, or is there an interest in interacting with the facilities that perform these tests. Using this instrument, we may be able to better understand public perception and reception to new ideas of research transparency. For example, the majority of people may find value in neurological studies, but may not be comfortable in witnessing a necropsy performed on dogs in a neurological study. This kind of fine grained analysis may determine how much rearranging of the program spaces could occur.

This project serves as a valuable starting point in attempting to resolve the issues of transparency in the animal testing environment. *OUT! of the Basement* has only begun to scratch the surface in how these matters could be solved using an architectural lens. Hopefully designers of the future may utilize this information to further the dialogue between those opposed to these ideals, and those who wish to see them become a reality.

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BALL STATE UNIVERSITY

Office of Research Integrity
Institutional Review Board (IRB)
2000 University Avenue
Muncie, IN 47306-0155
Phone: 765-285-5070

DATE: March 1, 2017

TO: Alexander Franklin

FROM: Ball State University IRB

RE: IRB protocol # 1029687-1

TITLE: The Indianapolis Animal Testing and Educational Center: A Theoretical Development within Downtown Indianapolis

SUBMISSION TYPE: New Project

ACTION: **DETERMINATION OF NOT HUMAN SUBJECTS RESEARCH**

DECISION DATE: March 1, 2017

REVIEW TYPE: Administrative Review

The Institutional Review Board received the above protocol. After review and consideration, the IRB concluded that this project does not meet the definition of 'research with human subjects' at this time, as specified by federal regulations at 45 CFR 46.

> **Research:** A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge.
> *(Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program which is considered research for other purposes.)*
> **Human Subject:** A living individual about whom an investigator (whether professional or student) conducting research obtains: (1) data through intervention or interaction with the individual or (2) identifiable private information.

Consequently, this project does not require IRB approval as submitted. The IRB accepts this information for our records and will retain it in our files. Thank you for providing the IRB with these materials for review. Please contact the Office of Research Integrity if any details of the study are to change so that the IRB may reconsider the protocol, if necessary.

If you have any questions regarding this decision or would like to respond in person, please contact the Office of Research Integrity.